

# *UNH's Coordinated Approach to Emissions Reduction Energy Savings and Alternative Fuel Fleet*



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Campus Planning  
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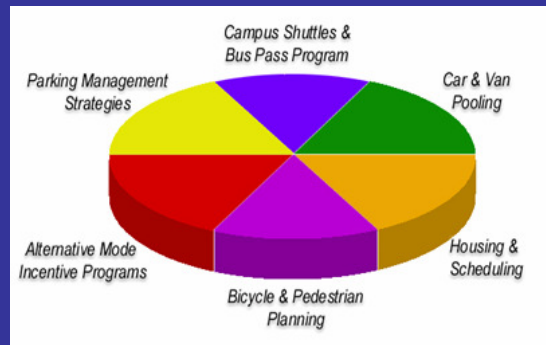
Green Your Fleet – Manchester NH



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# Systems Approach

- Sustainability ⇔ Climate Education ⇔ Transportation Systems
- After heat and electricity, fleet fuel consumption and personal commuting are the biggest energy uses and emission generators at UNH. **FY 2009 fleet fuel was \$558,000 (229,000 gge)**
  - Eco-Line™ deals with first two items.... One of our next focuses UNH fleet and commute/transportation
- We are approaching the issue with a series of institutional practices, data collection, transportation system choices, demonstration of new technologies and general community education



# Transportation Energy and Emissions

## Fleet and Commute

- An institution is responsible for:
  - its **own** fleet operations, fuel consumption and emissions
  - the fleet emissions it induces (travel/commute patterns and modes)
- This calls for a holistic approach which affects operations; land use and regional cooperation
- Affecting change on operations is **step 1**....affecting change on *induced* transportation is another much more cultural and incremental effort



# Evolving Transportation Policy

## *Leadership and Community Dialog*

- **2001 Transportation Demand Management Policy**
  - dialog on transportation choices, costs and impacts on land-use, climate and energy
- **2004 Campus Master Plan** - reinforces walking campus
- **System Improvements since 2001 - Positive Results:**
  - **Local and Regional Transit** ↑ **100%** - >1.1 million trips last year
  - **Intercity Transit (Amtrak Downeaster and C&J)** ↑ **500%** - >60,000 this year
  - **2004-2009 UNH fleet fuel consumption:**
    - Gas and petroleum diesel ↓ **8% since 2001**
    - CNG introduced in 2001 ↑ **saved >15,000** gallons gas/diesel in FY 09
    - Biodiesel (B20) introduced 2006 ↑ - **saved 16,000** gallons petroleum diesel in FY 09
    - Increasing hybrid, CNG, biodiesel and electric vehicles in our fleet
  - **Parking Permits** - flat or down in last years
  - **Ongoing improvements** to short-term access, campus transit standards



# CNG at UNH



- CNG at UNH since 2001
- Fuel Station, Garage renovations and fleet (transit and general)
- 125 scfm fuel station complete by fall
  - ( 5 min fills vs 30min)
- 17 vehicles including 7 transit
- Over 200,000 CNG miles in FY 09 that equated to over 15,000 gge
- FY 09 Fuel savings of \$15,000
- Estimated 375 tons CO2 savings since 2001
- fleet expansion (5 transit and 2-5 non-transit) should yield 250,000 miles and 22,000 gge





# Biodiesel at UNH



- In coordination with DOT B20 arrived in summer 2006
- Transitioning diesel fleet to B20 year round...Year 1 crossover
- UNH has +/- 60 diesel vehicles
- 85% now running on B20:
  - In FY 2009 used 85,543 gallons B20
  - Equivalent to 16,350 gals bio (avoided petroleum)
- Estimated to have saved 190 tons CO<sub>2</sub> since 2006
- Goal FY 09: 90% & 90,000 gals



# Fleet Fuel Consumption and Emissions

UNH Diesel Fleet - Petrodiesel, B20 and Biofuel Use (gallons)					
Fiscal Year	Petrodiesel	B20 biodiesel	Combined	Petrodiesel	Biofuel
2006	110,309	0	110,309	110,309	0
2007	51,368	51,805	103,173	92,812	10,361
2008	26,687	77,092	103,779	88,360	15,419
2009	23,465	85,543	109,009	92,658	16,351
2010 projection	20,180	94,098	114,278	97,136	17,142

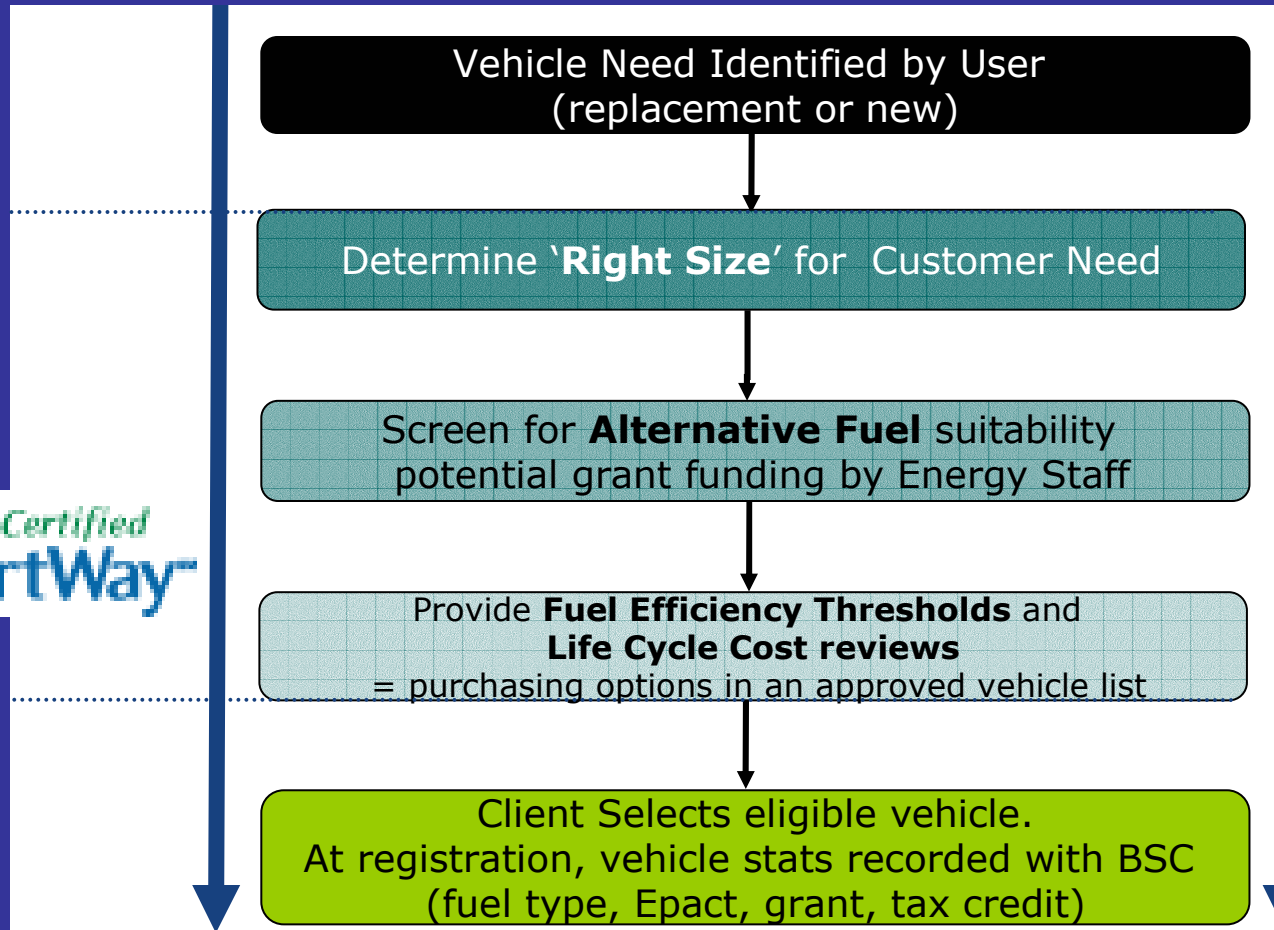
## CNG Usage

Fiscal Year	CNG (gge)	% Transit Fleet Use	% Total Fleet Use
2005	19,435	21%	9%
2007	15,754	18%	7%
2009	15,273	19%	7%
2010 projection	22,000	28%	10%



# Institutionalizing Choices:

## Clean Fleet Practices and Policies





# Fleet Fuel Efficiency

## *Next Steps*

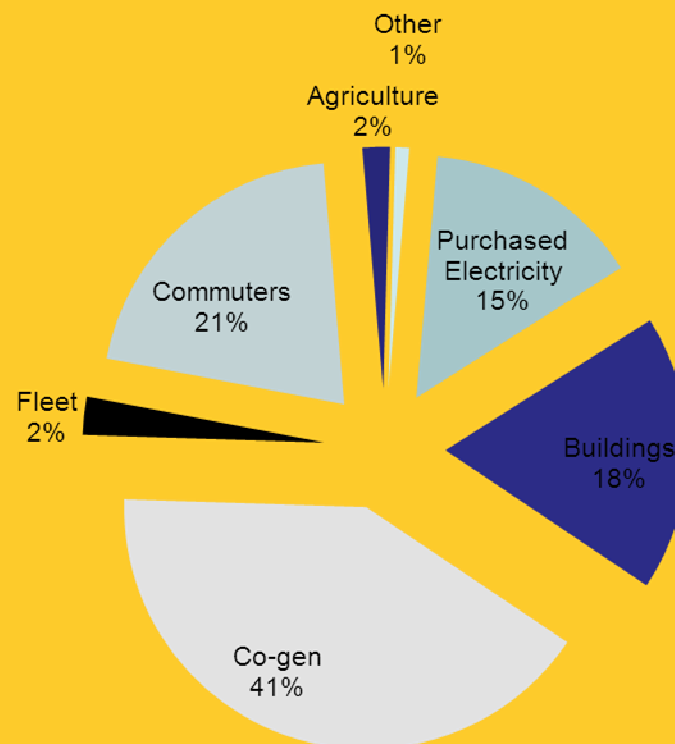
- Fulfill Mandates and meet/exceed State/Fed and UNH Goals
  - Governor's Executive Order re Fuel Efficiency
  - EAct requirements (Energy Policy Act 1992)
- Complete CNG infrastructure expansion – a focus fuel
- Demonstrate leadership as part of Climate Education Initiative
- Formalize Vehicle Selection Policies utilizing life cycle & emission costs
- Utilize selection procedures from other fleet operators with similar goals
- Improve benchmarking and data collection
- Continue Clean Fleet and Eco-Cat development and promotion
- Continue AFV infrastructure research, support and investment



# Emissions Data Snapshot

2004-2005 UPDATE

GREENHOUSE GAS EMISSIONS INVENTORY



Fleet  
change is  
essential  
but not  
adequate



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# 20 Year Master Plan Context

Reducing Commute trips (VMT) and emissions  
through on-Campus Housing

Population Component	2002 Base	2012 Build Projection	2022 Build Projection
Faculty/Staff (all commute)	3,320	3,400	3,520
Graduate (all commute)	2,150	2,325	2,500
Undergraduate Population:	10,850	11,450	12,000
On-Campus undergraduate housing	5,610	6,400	7,200
On-Campus family/graduate housing	333	420	566
<b>Commute population</b> Faculty/Staff <i>plus</i> students <i>minus</i> on-campus housing	10,377	10,355	10,254

*Reduced traffic and emissions due to  
significant increases in on-campus housing*



# Demonstrating New Technologies and Services:



Do you want to  
*hybrid-ize* your order?



**Supersized fuel efficiency**

**Superlow emissions**

**Super deal for you**

Enterprise Rent-A-Car now offers two Honda Civic hybrids in its UNH Durham rental fleet!



ENERGY AND CAMPUS DEVELOPMENT

UNIVERSITY of NEW HAMPSHIRE

UNIVERSITY OFFICE OF  
SUSTAINABILITY

UNH Energy and Campus Development and the University Office of Sustainability, in conjunction with the UNH Energy Task Force and the Maine Electric Vehicles (Falmouth), will be hosting two all-electric Neighborhood Electric Vehicles (NEV). For a two week period, March 10 – March 24, these two vehicles will be available for test drives by UNH departments. These vehicles are being evaluated as part of UNH's ongoing commitment to growing a Clean Fleet of vehicles. The University currently has electric, compressed natural gas (CNG) and biodiesel powered vehicles as part of its Eco-Cat™ fleet. The two NEV's will be the first all-electric passenger vehicles UNH has tested.



The two vehicles being tested are the Zenn ([www.zenncars.com](http://www.zenncars.com)), a sporty two-seater and the Miles ([www.milesev.com](http://www.milesev.com)), a more utilitarian 4-door mini-SUV style vehicle.



The Zenn



The Miles



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# Next Steps

*After the Co-Gen landfill gas project and combined with ongoing building and fleet efficiency improvements that commuting provides the next significant energy and emissions reduction opportunity for the university.*

## The 5% goals:

- Fleet Fuel
  - In FY 11 increase CNG and B20 shares by 5% each....
- Fleet Efficiency
  - FY 10-11 document and move to increase passenger fleet by 5%
- SOV Commuter
  - Move 5% more of current SOV commuters into transit or non SOV commute
  - up to 200 commutes/day – 200 parking spaces freed / 6-8,000 VMT reduced/day
    - 75,000 gallons of fuel reduction/yr and 860 tons/yr of CO<sub>2</sub>e
  - Cost deferral of \$1 million in new parking infrastructure/ \$80,000 yr operational costs



# Coordinated Efforts

## Energy-Transportation – Climate Education

- **UNH Clean Fleet Programs**

- Eco-Cat alternative fuel
- B20 Biodiesel transition
- CNG for on-campus
- Enterprise hybrid fleet
- Right-sizing and AFV use



- **DOT/DOE/EPA Partnerships** on high visibility successful projects

- Over **\$6.5 million** of USDOT and USDOE funds leveraged for transit, rail station, ped/bike and alternative fuel projects



- **Investment in Transit**

- Leveraged USDOT funds
- Voluntary student investment
- Expanded free community transit
- Cost-effective utilizing student drivers
- Largest transit agency in state
  - Projected 1 million trips removing over 4 million VMT in 09-10



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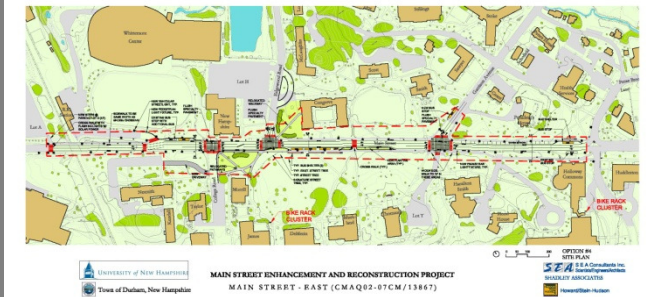
# Transportation Improvements Underway

## New Transit Fleet – Ongoing

*\$1.5 million of new clean fuel vehicles since 05*

## Main Street-East (2007)

*\$1.9 million street redesign improved bike/transit*



## Rail Station (2007-8)

*\$913,000 renovation and transit improvements*

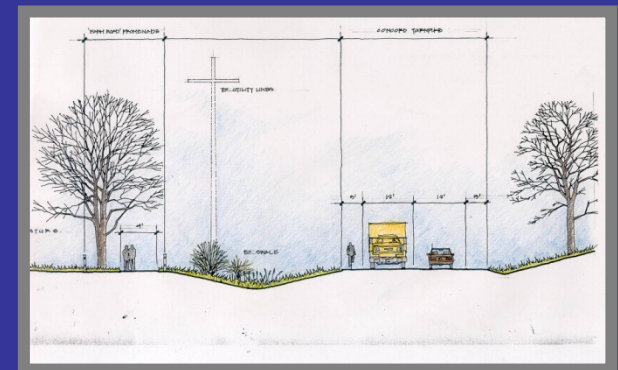


## CNG Station/Garage Upgrade (2008-10)

*\$900,000 renovation and transit improvements*

## Main Street-West (2010)

*\$350,000 multi-use trail/sidewalk to west edge*



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